REMARKS

This is in response to the Office Action mailed on March 22, 2005. Pending in the present application are claims 1-19, all of which were rejected in the Office Action as being anticipated under 35 U.S.C. § 102(e) by Ottesen et al., U.S. No. 6,608,727 ("Ottesen"). With this Amendment, the specification and claims 1, 6, and 13 are amended to correct typographical errors. Also, the "digitizing the readback signal" element of independent claim 13 is moved to new claim 20 depending from claim 13. In reliance on the following remarks, Applicant believes that claims 1-20 are in condition for allowance and respectfully requests reconsideration and notice to that effect.

The present invention is a novel apparatus and method for determining head media modulation as a function of time in a magnetic data storage and retrieval system. (Abstract). In particular, independent claim 1 (and its dependent claims 2-5) is directed toward a system having a rotatable magnetic disc having a readback signal stored over a section of the disc, a transducing head for reading the readback signal from the magnetic disc, means for processing the readback signal to calculate a dynamic harmonic ratio as a function of time, and means for calculating head media modulation as a function of time from the dynamic harmonic ratio.

Independent claim 6 (and its dependent claims 7-12) is directed toward a system having a rotatable magnetic disc; a transducing head for reading a readback signal from the magnetic disc; and a processing circuit for (a) calculating a frequency spectrum of the readback signal for each of multiple selected sampling intervals, (b) calculating a harmonic ratio for each of the selected sampling intervals based on the calculated frequency spectrum for each of the selected sampling intervals, (c) generating a dynamic harmonic ratio for the readback signal from the harmonic ratio calculations, and (d) generating a head media modulation signal as a function of time from the dynamic harmonic ratio.

Independent claim 13 (and its dependent claims 14-19) is directed toward a method for determining a dynamic harmonic ratio for an entire readback signal, which method includes calculating a frequency spectrum of a readback signal for each of multiple selected sampling intervals, calculating a

harmonic ratio for each of the selected sampling intervals based on the calculated frequency spectrum for each of the selected sampling intervals, generating a dynamic harmonic ratio for the readback signal from the harmonic ratio calculations, and generating a head media modulation signal as a function of time from the dynamic harmonic ratio.

Differently, Ottesen teach a method and an apparatus for determining whether or not the tribology for a head/disc interface is adequate. (Col. 1, lines 7-10; col. 3, lines 15-25). According to a preferred method of Ottesen, a readback signal is obtained from a predetermined erased track of a magnetic disc. (Col. 1, lines 43-44; col. 4, lines 62-65). Where the track has not been erased, the readback signal is preferably low pass filtered to render the readback signal representative only of thermal activity between the MR head and the disc surface. (Col. 2, lines 27-42; col. 4, lines 62-65). The readback signal is then sampled, the samples from each sector of the track summed, and predetermined discrete Fourier transform (DFT) components are calculated from the sector sums. (Col. 2, lines 46-65). A harmonic ratio of the predetermined DFT components for that sector is then compared to a predetermined threshold value. (Col. 3, lines 11-18). If the harmonic ratio exceeds the predetermined threshold value, the tribology is adequate, and otherwise, there may be cause for concern for the lubricity or durability of the head/disc interface. (Col. 3, lines 18-25).

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. §2131 (citations omitted). Here, as detailed below, Ottesen does not anticipate the claimed invention because it does not teach each and every element of independent claims 1, 6, and 13 of the present application.

First, claim 1 recites "a readback signal stored over a section of the magnetic disc"; claim 6 recites "a readback signal representative of the data from the magnetic disc"; and claim 13 recites "a magnetic disc having a readback signal stored therein". Ottesen does not teach or suggest the storage of this readback signal on the magnetic disc for retrieval in determining the head media modulation. Rather, Ottesen urges that an erased track be used so that the readback signal is representative of only thermal

activity, and not data stored on the disc. In fact, to the extent that the track is not erased, Ottesen teaches that the readback signal should be low-pass filtered to remove the data from the signal. (Col. 4, lines 62-65).

Second, claim 1 recites "means for processing the readback signal"; claim 6 recites "calculating a frequency spectrum of the readback signal"; and claim 13 recites "storing the readback signal". Ottesen does not teach or suggest any of these uses of the readback specified in the present claims. Ottesen teaches that either an erased track is read, or that the readback signal be low-pass filtered to remove any data from the signal, so that the processed signal is representative of only thermal activity. Unlike the claimed invention, the method and apparatus of Ottesen does not process the readback signal, calculate a frequency spectrum of the readback signal, or even store the readback signal.

Third, claim 1 recites "means for processing the readback signal to calculate a dynamic harmonic ratio as a function of time"; claim 6 recites "a processing circuit for ... generating a dynamic harmonic ratio for the readback signal from the harmonic ratio calculations"; and claim 13 recites "generating a dynamic harmonic ratio for the readback signal from the harmonic ratio calculations". A dynamic variable is one characterized by continuous change, activity, or progress. Ottesen does not teach or suggest the calculation of a dynamic harmonic ratio. Rather, Ottesen teaches only that a discrete harmonic ratio (i.e., single value) should be calculated for each track of each disc. Each of these discrete harmonic ratios is compared to predetermined thresholds to determine if the head/disc interface is adequate or not adequate. There is no teaching or suggestion that a dynamic harmonic ratio be calculated.

Fourth, claim 1 recites "means for calculating head media modulation as a function of time"; claim 6 recites "a processing circuit for ... generating a head media modulation signal as a function of time"; and claim 13 recites "generating a head media modulation signal as a function of time". Ottesen does not teach or suggest the generation of this head media modulation signal as a function of time. In fact, Ottesen does not teach a method for quantitatively measuring the head disc spacing modulation. Rather, Ottesen

teaches a type of static measurement which determines only the steady-state tribology condition of the head/disc interface.

Because Ottesen does not teach or suggest each and every element of independent claims 1, 6, and 13, the rejection of these claim should be withdrawn. Further, dependent claims 2-5, 7-12, and 14-19 are also patentable for the same reasons as their respective base claims. In addition, it is respectfully submitted that the combinations of features recited in these dependent claims are patentable on their own merits.

For example, claim 2, which depends from claim 1, recites that the means for processing the readback signal to calculate a dynamic harmonic ratio includes forming sampling intervals and calculating a harmonic ratio measurement for each of the sampling intervals. Nowhere does Ottesen teach or suggest this element. Rather, Ottesen teaches that predetermined DFT components are computed for each data sector sum, and that a single harmonic ratio for all of the data sectors in the track.

In a further example, claim 8, which depends from claim 6, recites that the processing circuit determines a modulation frequency of the dynamic harmonic ratio for the readback signal. Claim 9 adds further that the processing circuit filters the head media modulation signal using the determined modulation frequency. Nowhere are these elements taught or suggested by Ottesen.

Regardless of their own patentable characteristics, it is respectfully submitted that the combinations of features recited in dependent claims 2-5, 7-12, and 14-20 need to be specifically addressed herein since any claim depending from a patentable independent claim is also patentable. See M.P.E.P. § 2143.03, citing *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

In view of the foregoing, pending claims 1-20 are in condition for allowance. Reconsideration and notice to that effect is respectfully requested.

Respectfully submitted,

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Date: 6/22/05

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